

Claim Amendments

Please amend claims 1, 3, 4-6, 10, 11, 13, 15-19 as follows.

Please cancel claim 2, 7, 8, 14, 20 as follows.

Please add new claim 21 as follows:

Claims as Amended

1. (currently amended) A method for pre-etching a semiconductor wafer comprising tungsten oxide prior to a chemical mechanical polishing (CMP) process to achieve a uniform tungsten polishing rate comprising the steps of:

providing a wafer process surface having a layer of ~~an~~ tungsten oxide ~~of a metal~~ overlying ~~said metal~~ tungsten to be chemically mechanically polished;

removing the layer of ~~an~~ tungsten oxide ~~of the metal~~ according to an etching process selected from the group consisting of dry etching with a fluorocarbon etching chemistry and wet etching with a aqueous basic solution;

cleaning the semiconductor wafer to include the wafer process surface according to a wet cleaning process; and,

chemically mechanically polishing the wafer process surface according to a CMP process ~~including~~ comprising applying at least an abrasive slurry to the wafer process surface.

2. (cancelled)

3. (currently amended) The method of claim 1, wherein ~~the step of removing the layer of an oxide of the metal further comprises using a wet chemical etchant wherein the wafer process surface is subjected to at least one of dipping into the wet chemical etchant and spraying the wet chemical etchant onto the wafer process surface while~~ the wet etching process comprises simultaneously agitating the wafer process surface.

4. (currently amended) The method of claim 3, wherein agitating the wafer process surface ~~includes at least one~~ is selected from the group consisting of megasonic energy and brushing.

5. (currently amended) The method of claim 1 3, wherein ~~the wet chemical etchant is an~~ aqueous basic solution ~~with~~ has a pH of greater than about 10.

6. (currently amended) The method of claim 5, wherein the ~~wet chemical etchant includes~~ aqueous basic solution consists essentially of potassium hydroxide (KOH) and water.

7. - 8. (cancelled)

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9. (original) The method of claim 1, wherein the wet cleaning process comprises using deionized water wherein the wafer process surface is subjected to at least one of dipping into the deionized water and spraying the deionized water onto the wafer process surface while simultaneously agitating the wafer process surface.

10. (currently amended) The method of claim 1, wherein the CMP process further includes applying a polishing solution to the wafer process surface for forming an oxide layer in-situ over the tungsten metal.

11. (currently amended) The method of claim 10, wherein the polishing solution ~~includes at least~~ comprises hydrogen peroxide.

12. (original) The method of claim 1, further including a wafer process surface cleaning step following the step of chemically mechanically polishing.

13. (currently amended) A method for pre-etching a semiconductor wafer comprising tungsten oxide prior to a chemical mechanical polishing (CMP) process to achieve a uniform tungsten polishing rate comprising the steps of:

providing a wafer process surface having a layer of ~~an tungsten oxide of a metal~~ overlying ~~the metal~~ tungsten to be chemically mechanically polished; ~~and,~~

removing the layer of ~~an tungsten oxide of the metal~~ according to an etching process[.] selected from the group consisting of dry etching comprising a fluorocarbon etching chemistry and wet etching comprising an aqueous basic solution while simultaneously agitating the process surface;

cleaning the semiconductor wafer to include the wafer process surface according to a wet cleaning process comprising agitating the process wafer surface; and,

chemically mechanically polishing the wafer process surface according to a CMP process comprising applying at least an abrasive slurry to the wafer process surface.

14. (cancelled)

15. (currently amended) The method of claim 13, wherein the ~~step of removing the layer of an oxide of the metal further comprises using a wet chemical etchant wherein the wafer process surface is subjected to at least one~~ wet etching process is selected from the group consisting of dipping into the aqueous basic solution ~~wet chemical etchant and spraying the aqueous basic solution wet chemical etchant onto the wafer process-surface while simultaneously agitating the wafer process surface.~~

16. (currently amended) The method of claim 13 ~~15~~, wherein agitating the wafer process surface includes at least one of megasonic energy and brushing.

17. (currently amended) The method of claim 13 ~~15~~, wherein the ~~wet chemical etchant is an~~ aqueous basic solution with has a pH of greater than about 10.

18. (currently amended) The method of claim 17, wherein the ~~wet chemical etchant includes~~ aqueous basic solution consists essentially of potassium hydroxide (KOH) and water.

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19. (currently amended) The method of claim 13, wherein the ~~step of removing the layer of an oxide of the metal further comprises plasma etching the layer of an oxide of the metal according to~~ dry etching process comprises a reactive ion etch process comprising CF₄ and oxygen.

20. (cancelled)

21. (new) The method of claim 1, wherein the dry etching process comprises a reactive ion etch process comprising CF₄ and oxygen.